

## **REMARKS**

Claims 10-21 are pending in this application.

Applicants have amended claims 10, 15, 17, and 20. The changes to the claims made herein do not introduce any new matter, as will be explained in more detail below.

### **Claim Amendments**

Applicants have amended independent claims 10 and 17 to specify the configuration of the inlet ports and outlet ports in more detail. In particular, claims 10 and 17 have been amended to specify that the bottom surface of the proximity head has a plurality of outlet ports and a plurality of vacuum inlet ports, and that the plurality of vacuum inlet ports surrounds the plurality of outlet ports. As shown in Figures 1A-1D and 7C of the subject application, outlet ports 192, 762, and 764 supply liquid to surface of the wafer 150 and vacuum inlet ports 194 and 768 remove the liquid from surface of the wafer. Further, the outlet ports 192, 762, and 764 are surrounded by the vacuum inlet ports 194 and 768.

Applicants have amended claims 15 and 20 to define a proximity head having first and second channels in the heating portion, with the first and second channels being separated by a material having sufficient thermal conductivity so that heat from a circulating liquid in the second channel can be exchanged with the liquid in the first channel. Support for the changes made to claims 15 and 20 can be found in Applicants' specification at, for example, Paragraphs 00045-00049.

### **Double Patenting Rejections**

Applicants acknowledge the obviousness-type double patenting rejections entered in the Office Action. As each of these rejections is a *provisional* rejection, Applicants will take appropriate action once the subject application has been indicated to be otherwise in condition for allowance.

Rejections Under 35 U.S.C. § 103

Applicants respectfully request reconsideration of the rejection of claims 10 and 16 under 35 U.S.C. § 103(a) as being unpatentable over *de Larios et al.* (“*de Larios*”) (US 6,488,040 B1) in view of *Tsutsui et al.* (“*Tsutsui*”) (JP 2001-220688) (referred to as “*Yuji et al.*” in the Office Action). As will be explained in more detail below, the combination of *de Larios* in view of *Tsutsui* would not have rendered the subject matter defined in independent claim 10, as amended herein, obvious to one having ordinary skill in the art.

In formulating the obviousness rejection, the Examiner asserts that *de Larios* discloses all of the features specified in claim 10, except for the proximity head including a heating portion. The *de Larios* reference discloses a capillary proximity head for single wafer cleaning and drying. At column 6, lines 8-33, *de Larios* states:

FIG. 4 shows a magnified cross-sectional view of a proximity head 102a in accordance with one embodiment of the present invention. In this embodiment, a ***plurality of source inlets 106 and a plurality of source outlets 104 are interspersed throughout the proximity head 102a.*** Each of the plurality of source inlets 106 and each of the plurality of source outlets 104 are long but thin capillary tubes. The ***tubes including the plurality of source outlets 104 are small in diameter and allow capillary action*** (such as, for example, capillary attraction) to take place when located in a position close to the surface of the wafer 108. There, fluid on the surface of the wafer 108 is attracted to the inside surface of the each of the plurality of source outlets 104. Consequently, the fluid moves into the plurality of source outlets 104 by capillary action. With the addition of clean gas pressure or liquid pressure induced by the plurality of source inlets 106 and suction pressure through the plurality of source outlets 104, fluid on the surface of the wafer is easily and efficiently evacuated while extensively reducing droplet formation on the wafer surface. In one embodiment, there are about 2 million capillary tubes dispersed throughout the proximity head 102a that is configured to process 300 mm wafers. It should be understood that any number of capillary tubes may be used in the proximity head 102a as long as liquid can be evacuated off of the surface of the wafer 108 while reducing droplet formation. [Emphasis and underlining added.]

As set forth above, the source inlets 106 and the source outlets 104 are *interspersed* throughout the proximity head 102a shown by *de Larios*. Thus, *de Larios* does not teach any particular arrangement of the inlet ports and outlet ports in the surface of the proximity head.

Further, the source outlets shown by *de Larios* are small in diameter and allow *capillary action*. In contrast, amended claim 10 specifies that the bottom surface of the proximity head has a plurality of outlet ports and a plurality of vacuum inlet ports, and that the plurality of vacuum inlet ports surrounds the plurality of outlet ports. The *de Larios* reference does not disclose or suggest the specific configuration of outlet ports and vacuum inlet ports specified in amended claim 10.

The *Tsutsui* reference discloses a thin film deposition system that includes a spray nozzle provided with a heat source. Nothing in the *Tsutsui* reference cures the above-discussed deficiencies of the *de Larios* reference relative to the configuration of the proximity head specified in amended claim 10. Thus, even if the *de Larios* and *Tsutsui* references were to be combined in the manner proposed by the Examiner, the result would not have been a proximity head having the features specified in amended claim 10. Thus, the combination of *de Larios* in view of *Tsutsui* does not raise a *prima facie* case of obviousness against the subject matter defined in amended claim 10.

Accordingly, claim 10, as amended herein, is patentable under 35 U.S.C. § 103(a) over the combination of *de Larios* in view of *Tsutsui*. Claim 16, which depends from claim 10, is likewise patentable under 35 U.S.C. § 103(a) over the combination of *de Larios* in view of *Tsutsui* for at least the same reasons set forth above regarding claim 10.

Applicants respectfully request reconsideration of the rejection of claims 11-14 under 35 U.S.C. § 103(a) as being unpatentable over *de Larios* in view of *Tsutsui*, and further in view of *Kawamura et al.* (“*Kawamura*”) (US 5,696,348) (Applicants have disregarded the reference to *Yun et al.* in the statement of this rejection on page 7 of the Office Action because Applicants established in a prior paper that *Yun et al.* is not available as section 103 prior art against the subject application). Each of claims 11-14 ultimately depends from independent claim 10. The *Kawamura* reference does not cure the above-discussed

deficiencies of the *de Larios* and *Tsutsui* references relative to the subject matter defined in amended claim 10. Accordingly, claims 11-14 are patentable under 35 U.S.C. § 103 over the combination of the *de Larios*, *Tsutsui*, and *Kawamura* references for at least the reason that each of these claims ultimately depends from claim 10.

Applicants respectfully request reconsideration of the rejection of claims 15, 17, 20, and 21 under 35 U.S.C. § 103(a) as being unpatentable over *de Larios* in view of *Tsutsui*, and further in view of *Nakamura et al.* (“*Nakamura*”) (JP 08-277486) (referred to as “*Kenji et al.*” in the Office Action) (Applicants have disregarded the reference to *Yun et al.* in the body of this rejection (see page 8 of the Office Action) because Applicants established in a prior paper that *Yun et al.* is not available as section 103 prior art against the subject application).

Considering first independent claim 17, as noted above, claim 17 has been amended along the same lines that claim 10 has been amended. Thus, the above-discussed deficiencies of the *de Larios* and *Tsutsui* references relative to the subject matter defined in amended claim 10 also apply to the subject matter defined in amended claim 17. The *Nakamura* reference does not cure the deficiencies of the *de Larios* and *Tsutsui* references relative to the subject matter defined in amended claim 17. Thus, the combination of the *de Larios*, *Tsutsui*, and *Nakamura* references does not raise a *prima facie* case of obviousness against the subject matter defined in amended claim 17.

Turning to claims 15 and 20, as noted above, each of these claims has been amended to define a proximity head having first and second channels in the heating portion, with the first and second channels being separated by a material having sufficient thermal conductivity so that heat from a circulating liquid in the second channel can be exchanged with the liquid in the first channel. The heaters shown in the *Tsutsui* and *Nakamura* references are electrically powered heaters. As such, neither of these references discloses or suggests a second channel containing a circulating liquid that is used to exchange heat with the liquid in

the first channel as specified in amended claims 15 and 20. Thus, the combination of the *de Larios*, *Tsutsui*, and *Nakamura* references does not raise a *prima facie* case of obviousness against the subject matter defined in either amended claim 15, which depends from claim 10, or amended claim 20, which depends from claim 17.

Accordingly, for at least the foregoing reasons, claims 15, 17, and 20, as amended herein, are patentable under 35 U.S.C. § 103(a) over the combination of the *de Larios*, *Tsutsui*, and *Nakamura* references. Claim 21, which depends from claim 17, is likewise patentable under 35 U.S.C. § 103(a) over the combination of the *de Larios*, *Tsutsui*, and *Nakamura* references for at least the same reasons set forth above regarding claim 17.

#### Conclusion

In view of the foregoing, Applicants respectfully request reconsideration and reexamination of claims 10-21, as amended herein, and submit that these claims are in condition for allowance. In the event a telephone conversation would expedite the prosecution of this application, the Examiner may reach the undersigned at (408) 749-6902. If any additional fees are due in connection with the filing of this paper, then the Commissioner is authorized to charge such fees to Deposit Account No. 50-0805 (Order No. LAM2P451).

Respectfully submitted,  
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